

**KEYS TO THE FLORA OF FLORIDA - 29,
SPERMACOCE (RUBIACEAE)**

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ABSTRACT

Spermacoce (Rubiaceae) is represented in Florida by 9 species. Of these, 6 appear to be native, and 3 are introduced. One (*S. terminalis*) is endemic and is rated as threatened; none is endangered. The nomenclatural basis for certain names is detailed. One species reported for Florida is excluded. An amplified key is given to the Florida taxa. *Phytologia* 93(3): 275-282 (December 1, 2011)

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Depending on how its limits are drawn, *Spermacoce* (Rubiaceae) is a genus of perhaps 150 species (Mabberley, 1997), many of the New World tropics but with representation in Africa and Asia. The species, by and large, are inconspicuous and innocuous and attract little attention. The differences between species are not striking. Keys to their identification are often too brief and artificial to be reliable. The few species that are weedy are an insignificant impediment to agricultural or horticultural objectives. None is believed to have commercial value or use. They are at times touched upon by rubiologists and of course must be treated by writers of floras. But perhaps as a result of this unimportance, the distinctions between species are little understood. The comment of R. A. Howard (Fl. Less. Antilles 6: 462. 1989) is also apt for Florida: "Few genera of the Lesser Antillean flora were represented by so many erroneous identifications or completely unidentified specimens."

The present task is to examine the species of *Spermacoce* found in Florida, to survey the scant literature, gain a confidence in the

correct use of their scientific names, and to prepare a key that carries sufficient detail to permit correct identification.

Delimitation of *Spermacoce* requires consideration of an obscure fruit character. Linnaeus (1753) and his immediate successors placed an array of related species within *Spermacoce*; all shared the 2-celled ovaries, glomerulate flowers (the source of the vernacular "Buttonweed"), and 2-seeded capsules that dehisced lengthwise into two nutlets or mericarps. Linnaeus had observed in some similar species these nutlets did not dehisce, and he held them separate as the genus *Diodia*. A later worker, Meyer (1818), went a step further. He noted the capsules of some species dehisced unevenly, with one carpel opening to expose the seed and the other remaining closed (by adhesion of the membrane that had separated the two carpels); he named these *Borreria*.

Time and further judgments have viewed these entities differently. *Diodia* remains usually treated as of generic rank, although B. Verdcourt (Fl. Trop. E. Africa. 1976) has agonized over the similarity of African *Diodia* to some members of *Spermacoce* s. str. But *Borreria* is increasingly seen as differing too slightly from *Spermacoce* to merit generic rank. [Within *Spermacoce* a lower level distinction is still maintained, as sect. *Spermacoce* and sect. *Borreria* (Meyer) Verdcourt.] As indicated by their synonymy, 5 of the Florida species were once *Borreria*, while 4 are traditional *Spermacoce*.

The best present guide to the Florida *Spermacoce* is, as is so often the case, J. K. Small's *Manual* (1933). His treatment requires adjustment in that he retained *Borreria* at generic rank, his descriptions are often not diagnostic, and two species must be added and the names of others changed. Two papers by A. B. Rendle (J. Bot. 72: 329-333. 1934; 74: 10-12. 1936), though addressing Antillean plants, forced changes in names of two Florida species (see below). An often overlooked study from Argentina by N. M. Bacigalupo (Darwiniana 17: 341-357. 1972) has excellent plates of some Florida species: *S. confusa* (her *S. tenuior*), *S. tenuior* (her *S. riparia*), and *S. glabra* (her *Spermacoceodes glabra*). Her description and plate of *S. pilifera*

Bacig. seem identical to Florida's *S. tetraquetra*, and her failure to acknowledge this earlier name suggests the two indeed may be identical. R. P. Wunderlin (Phytologia 41: 313-316. 1979) has given a brief commentary and key to 5 Florida species. D. H. Nicolson (Smithsonian Contr. Bot. 77: 197-198. 1991), reporting on Dominica, described and keyed 4 Florida species of *Spermacoce*.

Certain names used in *Spermacoce* must be changed or are under challenge. The common weed long passing under the name *Borreria laevis* (Lam.) Griseb. has undergone change of both generic name and epithet. Lamarck's type was found to be based on a specimen of *Spermacoce tenuior* (B. Verdcourt, Kew Bull. 37: 521-574. 1983), thus *laevis* is lost. Then, by merger of the genera, *Borreria* also vanishes. The name becomes *Spermacoce assurgens*.

The name *Spermacoce tenuior* L. (1753) was long used incorrectly. Linnaeus had no specimen in 1753 (a specimen presently in the Linnean Herbarium was obtained from Patrick Browne in 1758), but he gave references to three earlier authors. That of Dillenius (1732) carried a figure; by the I.C.B.N. (Art. 9.1), for early years an illustration and the specimen it was based upon may be the type. Rendle (1934) was able to locate relevant specimens in the Dillenian Herbarium at Oxford. The specimen that matched the drawing is very like the Neotropical (and Florida) *S. floridana* Urban (1913) (= *S. keyensis* Small, 1914), which name it displaces. The former *S. floridana* then became *S. confusa* Rendle (1936).

R. W. Long (Rhodora 72: 36. 1970) distinguished the Florida plant as *S. tenuior* var. *floridana* (Urban) R. Long. In the event the native Florida plant should receive recognition at specific rank, *S. floridana* Urban has priority (D. B. Ward & F. C. Craighead, Sida 14: 287-304. 1990).

Distinction of the south peninsula endemic *Spermacoce terminalis* from the pan-tropic introduced *S. verticillata* has at times been obscured (Wunderlin, 1979), but is amply confirmed by A. Herndon (Sida 12: 79-89. 1987) and J. T. Kartesz & K. N. Gandhi

(Brittonia 44: 370-371. 1992). The differences are not only of morphology but habitat selection, and suggest a long isolation by *S. terminalis* from *S. verticillata*, its probable tropical progenitor. Herndon (1987) found a curious bimodal pattern of morphology within *S. verticillata* in Florida, indicating that there may have been two introductions of this non-native plant from a variable parent population.

A question of authorship needs comment. The combination *Spermacoce densiflora* has been attributed to "Alain" or to "Liogier" by different writers. It may have been overlooked that the author was Alain H. Liogier, and that he routinely accredited new combinations with his first name. Whatever his motive, Howard (1989) cited it correctly, as "Liogier."

Spermacoce prostrata Aubl. (1775) has occasionally been substituted for *S. ocymoides* Burm. f. (1768). This use may first have appeared in Wunderlin (1979); it was there justified by the statement: "*Borreria* [= *Spermacoce*] *ocimoides*, however, is a totally different species confined to the Paleotropics." The name then appeared in an addendum by A. C. Clewell (1985: 523) who reported having been told (by ?) the familiar *Borreria ocymoides* -- the name he had used -- was misapplied, and was corrected to *S. prostrata*. Then Nicolson (1991) also used *S. prostrata*, with the explanation that "Fosberg and Powell (in prep.) have determined that the basionym of the usual name for this species does not apply...." Nicolson's bibliography cited these authors with an intended title and the Pacific-based journal *Allertonia* much used by Fosberg.

The basis for the use of *Spermacoce prostrata* in reference to a Florida plant is unknown. A Google search, though showing many other Fosberg publications, was unproductive. The substitute name, with the epithet *prostrata*, seems unlikely to apply to this consistently erect plant. It may well be that *S. ocymoides* is a member of a complex in which the Florida plant is not the type. But until it can be shown that differences between the type of *S. ocymoides* and the Florida plant are of specific rank, it seems imprudent to adopt a novel name for which no adequate justification is on record.

What might have been a definitive paper on *Spermacoce* and apparently was long in preparation, seems to have been lost with the 1993 death of its author. F. R. Fosberg was surely the dean of rubiacean scholars, with many papers on this family to his credit. But, following the seemingly conclusive mention by Nicolson (1991), no record of Fosberg's manuscript has surfaced.

This paper is but a weak substitute for what Ray Fosberg would have produced. It is offered in the belief that even in its imperfect state it will be useful to persons who wish to name the Florida plants but have insufficient support from published sources.

SPERMACOCE L. Buttonweeds¹

1. Calyx with 2 long and 2 much shorter sepals (or shorter sepals lacking).
2. Terminal glomerule 1.0-2.0 cm. wide, many-flowered; corolla white; leaves with petiole 5-8 mm. long, blade broadly elliptic, 3-4 cm. long, 1.2-1.5 cm. wide, obtuse to rounded. Annual or short-lived perennial herb, to 0.5 m. Barren soils, sidewalk cracks. West and central panhandle (Escambia, Santa Rosa counties, e. to Leon Co.); rare. Spring-summer. [*Borreria densiflora* DC.]

* *Spermacoce densiflora* (DC.) Liogier

2. Terminal (or largest) glomerule 0.5-1.2 cm. wide, relatively few-flowered; leaves ovate to linear, acute.
3. Leaves ovate-elliptic, with 3-5 pairs of lateral veins, short-petioled; stems lacking axillary clusters of small leaves; corolla shorter than calyx, white; capsules ellipsoid to obovoid. Annual herb, to 0.3 m. Nearly throughout (excl. w. panhandle); common. Summer-fall. [*Borreria ocymoides* (Burm. f.) DC.; *Spermacoce prostrata* Aubl.]

* *Spermacoce ocymoides* Burm. f.

3. Leaves linear to linear-lanceolate, with 1-2 pairs of lateral veins, sessile or short-petioled; stems often with axillary clusters of small leaves; corolla longer than calyx, white; capsules obovoid to turbinate.

4. Corolla tube 1.2-2.5 mm. long; capsule >1.5 mm. long; leaves linear, 0.2-0.4 cm. wide; stems sprawling. Perennial herb. Seasonally wet pinelands, prairies. South peninsula (n. to Martin Co.); infrequent. All year. Endemic. Threatened (State listing). [*Borreria terminalis* Small]

Spermacoce terminalis (Small) Kartesz & Gandhi

4. Corolla tube 0.6-1.0 mm. long; capsule <1.5 mm. long; leaves linear to narrowly elliptic, 0.3-0.8 cm. wide; stems erect. Perennial herb, to 0.3 m. Roadsides, disturbed areas. South and central peninsula (n. to Brevard Co.); frequent. All year. [*Borreria verticillata* (L.) Meyer]

* **Spermacoce verticillata** L.

1. Calyx with 4 subequal sepals.

5. Flowers primarily in terminal glomerule; stamens exerted; corolla white with pink throat; sepals small, withering in fruit; capsules sparsely strigose on distal half; leaves narrowly ovate. Annual or short-lived perennial herb, to 0.5 m. Low hammocks, marshes, floodplains, ditch banks. Throughout; common. Summer-fall. [*Spermacoce laevis*, misapplied; *Borreria laevis* misapplied]

BUTTONWEED.

Spermacoce assurgens Ruiz & Pav.

5. Flowers primarily in few-flowered axillary glomerules; stamens included; sepals persistent in fruit.

6. Corolla strongly villous in throat, white; sepals rotate in fruit, long-deltoid (length ± 1.5 times width at base); capsules glabrous. Perennial herb, to 0.6 m. Low woodlands, riverbanks. Central panhandle (Apalachicola River bottoms: Calhoun, Liberty, Gadsden counties); infrequent. Summer-fall.

Spermacoce glabra Michx.

6. Corolla not villous in throat; sepals erect in fruit, narrow (length >5 times width at base); capsules glabrous or bristly pubescent.

7. Leaves coarsely hirsute; stems angular, bristly hirsute on the angles; corolla white with pink tinge. Annual herb, to 0.5 m. Disturbed hammocks, pinelands, often weedy. South peninsula (Collier, Dade counties); infrequent. All year

Spermacoce tetraquetra A. Rich.

7. Leaves and stem scabrous or glabrous.

8. Capsules bristly pubescent, 2.0-2.5 mm. long; sepals long-deltoid (length >2 times width at base); corolla white or light pink, the lobes less than 1/2 length of tube; leaves scabrous; stems angular, scabridulous on the angles. Annual herb, to 0.5 m. Coastal hammocks. South peninsula (Monroe Co.); very rare. Summer. [*Spermacoce tenuior*, misapplied]

Spermacoce confusa Rendle

8. Capsules smooth to granulose, 2.5-3.0 mm. long; sepals short-deltoid (length \pm equal width at base); corolla white, the lobes longer than tube; leaves glabrous; stems scarcely angular, smooth. Annual or short-lived perennial, to 0.3 m. Rock pinelands. South peninsula (Monroe, Dade counties); infrequent. All year. [*Spermacoce floridana* Urban; *Spermacoce keyensis* Small; *Spermacoce riparia* Cham. & Schlecht.]

Spermacoce tenuior L.

Excluded names:

Spermacoce tenella HBK.

Borreria tenella (HBK.) Cham. & Schl.

Reported for Penascola, Escambia Co. (Small, 1933, as a comment under *Borreria terminalis*; cited by Clewell, 1985). An old record, without later confirmation.

1. This paper is a continuation of a series begun in 1977. The "amplified key" format employed here is designed to present in compact form the basic morphological framework of a conventional dichotomous key, as well as data on habitat, range, and frequency. Amplified keys are being prepared for all genera of the Florida vascular flora; the present series is restricted to genera where a new combination is required or a special situation merits extended discussion.

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